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5 September 1961

MEMORANDUM FOR: TALENT Control Officers
(see distribution)

SUBJECT : Camera Information for Mission 9023, KH-3 Camera System

1. The following technical information necessary for the reduction of quantitative data obtained from photography of Mission 9023 is forwarded for your information.

a. This photography involves the use of three cameras: a main camera, a port horizon camera and a starboard horizon camera.

b. Operational Focal Lengths

(1)	Main lens	609.956 mm
(2)	Port horizon lens	89.15 mm
(3)	Starboard horizon lens	89.95 mm

Definition: "Operational focal length" is defined as the distance from the main lens nodal point to the film surface as measured on the lens bench, and the data reduced for a vacuum condition. (Operational focal length is equivalent focal length corrected for environment.)

c. Lens Distortion

(1) Main lens -- at 357° + .031 mm; at 357.5° + .015 mm; at 358° + .003 mm; at 359° - .002 mm; at 0° .000 mm; at 1° - .002 mm; at 2° - .021 mm; at 2.5° - .042 mm; at 3° - .068 mm.

(2) Port horizon lens -- Radial distortion at 10°, .004 mm; at 20°, .036 mm. Tangential at maximum vector .002 mm.

(3) Starboard horizon lens -- Radial distortion at 10°, .005 mm; at 20°, .033 mm. Tangential distortion at maximum vector .010 mm.

[redacted] 25X1

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d. Depression Angle of Horizon Cameras Relative to Nominal Main Camera

(1) Port Camera -- 15° 17' 14"
(2) Starboard Camera -- 15° 25' 10"

e. Image Motion Compensation

IMC changes at a linear rate over a 15 minute time period and can be determined from the scan velocity. Scan velocity can be determined from a count of the timing marks on each frame.
References: 1. Explanation of image motion compensation provided on KEYHOLE camera Systems.

PIC/TP-4/61
May 1961

2. Modification KH-3 KEYHOLE camera system

NPIC/TP-3/61
August 1961

f. Filter and Exposure Data

(1) Main lens -- Filter, wratten 21
Aperture, F/3.5
Exposure, 1/300 second (Nomhal)
Slit width, 0.2 inches (Nominal)

(2) Horizon Lens -- Filter, wratten 25
Aperture, F/6.8
Exposure, 1/200 second

g. Resolution Capabilities

(1) Main lens -- 184 lines per mm, ave.
(2) Port horizon lens -- 36 lines per mm, ave.
(3) Starboard horizon lens -- 39 lines per mm, ave.

These are lens/film combinations measuring on film.

h. Timing Marks

There are 160 cycles per second. Timing marks will be imaged on picture area in form of small white dots.

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1. Film Information

Emulsion used on Mission 9023 was SO-132.

2. For further information contact the Technical Intelligence Division, NPIC.

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TALENT Control Officer,
National Photographic Interpretation Center

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